

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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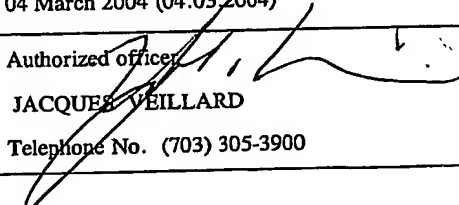
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| Applicant's or agent's file reference<br><b>07844-558WO1</b>  | <b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) |                                |
| International application No.<br><b>PCT/US02/31258</b>  | International filing date (day/month/year)<br><b>30 September 2002 (30.09.2002)</b>   | Priority date (day/month/year) |
| International Patent Classification (IPC) or national classification and IPC<br><b>IPC(7): G06F 17/30 and US Cl.: 707/104.1, 100, 203; 382/236, 243</b> |   |                                |
| Applicant<br><b>ADOBE SYSTEMS INCORPORATED</b>  |   |                                |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.  
☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 15 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

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|--|---|
| Date of submission of the demand<br><b>11 February 2004 (11.02.2004)</b>   | Date of completion of this report<br><b>04 March 2004 (04.03.2004)</b>  |
| Name and mailing address of the IPEA/US<br>Mail Stop PCT, Attn: IPEA/US<br>Commissioner for Patents<br>P.O. Box 1450<br>Alexandria, Virginia 22313-1450<br>Facsimile No. (703)305-3230 | Authorized officer<br><br><b>JACQUES VEILLARD</b><br>Telephone No. (703) 305-3900 |

**I. Basis of the report****1. With regard to the elements of the international application:\***☐ the international application as originally filed.☒ the description:pages 1-40 as originally filedpages NONE, filed with the demandpages NONE, filed with the letter of \_\_\_\_\_.☒ the claims:pages NONE, as originally filedpages NONE, as amended (together with any statement) under Article 19pages 41-55, filed with the demandpages NONE, filed with the letter of \_\_\_\_\_.☒ the drawings:pages 1-9, as originally filedpages NONE, filed with the demandpages NONE, filed with the letter of \_\_\_\_\_.☐ the sequence listing part of the description:pages NONE, as originally filedpages NONE, filed with the demandpages NONE, filed with the letter of \_\_\_\_\_.**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).☐ the language of publication of the international application (under Rule 48.3(b)).☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:**☐ contained in the international application in printed form.☐ filed together with the international application in computer readable form.☐ furnished subsequently to this Authority in written form.☐ furnished subsequently to this Authority in computer readable form.☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.**4. ☐ The amendments have resulted in the cancellation of:**☐ the description, pages NONE☐ the claims, Nos. NONE☐ the drawings, sheets/fig NONE**5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\***

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. STATEMENT**

|                               |                    |     |
|-------------------------------|--------------------|-----|
| Novelty (N)                   | Claims <u>1-59</u> | YES |
|                               | Claims <u>NONE</u> | NO  |
| Inventive Step (IS)           | Claims <u>1-59</u> | YES |
|                               | Claims <u>NONE</u> | NO  |
| Industrial Applicability (IA) | Claims <u>1-59</u> | YES |
|                               | Claims <u>NONE</u> | NO  |

**2. CITATIONS AND EXPLANATIONS**

Claims 1-59 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest comparing the composite reference information to information pertaining to the same feature for respective one for a plurality of media objects in a collection of media objects to identify one or more media objects wherein a non-Euclidian function is used either to combine the information pertaining to the feature, or compare the composite reference information to information pertaining to the same feature as recited in independent claims 1, 29, and 57. These limitations, in combination with the other limitations of the claims, were not disclosed by, nor would not have been obvious over, nor would have been fairly suggested by the prior of record.

The dependent claims 2-27, 30-55, and 58, being further limiting to the independent claims 1, 28, and 57, definite and enabled by the specification meet also the criteria set out in PCT Article 33(2)-(3).

Regarding independent claims 28, 56, and 59, the prior art does not teach or fairly suggest comparing the composite reference information to information pertaining to the same feature for each respective one of a plurality of the media objects in the collection of media objects, wherein comparing includes comparing the composite vector to the feature vector of each media object in the collection of media objects using a Min or Max function and assigning a similarity value to each media object in the collection media objects, where the similarity value of each of the media objects in the collection is less than or equal to the similarity value calculated for each reference object.

----- NEW CITATIONS -----

5 What is claimed is:

1. A method for searching a collection of media objects, comprising:

combining object information for a plurality of reference objects to produce  
composite reference information representing criteria for a search; and  
10 comparing the composite reference information to object information for  
media objects in a collection of media objects to identify one or more  
media objects in the collection of media objects.

2. The method of claim 1, further comprising:

15 receiving user input specifying the plurality of reference objects.

3. The method of claim 1, further comprising:

selecting a media object in the collection of media objects based upon the  
comparison of the object information and the composite reference  
20 information.

4. The method of claim 1, wherein:

the plurality of reference objects includes one or more objects having a type  
selected from: audio, image, text, CD, or video.

25

5. The method of claim 4, wherein:

combining object information for a plurality of reference objects includes  
combining object information for different types of objects.

5 6. The method of claim 1, wherein:

combining object information for a plurality of reference objects to produce  
composite reference information includes determining the intersection of  
the object information for the reference objects.

10 7. The method of claim 1, wherein:

combining object information for a plurality of reference objects to produce  
composite reference information includes determining the union of the  
object information for the reference objects.

15 8. The method of claim 1, wherein:

the object information characterizes features of the reference objects and the  
media objects in the collection of media objects.

9. The method of claim 8, wherein:

20 the object information is weighted to specify a relative importance of the  
features.

10. The method of claim 8, further comprising:

receiving user input indicating the relative importance of the features.

25

11. The method of claim 8, wherein:

at least one feature is represented by the relative frequency of occurrence of  
each of several values for the feature.

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5 12. The method of claim 8, wherein:

the set of features includes color information describing the relative frequency  
of occurrence of colors in an object.

13. The method of claim 8, wherein:

10 a feature for a first object type is mapped to a feature for a second object type.

14. The method of claim 1, further comprising:

combining object information for an additional reference object with the  
composite reference information to revise the composite reference  
15 information.

15. The method of claim 14, wherein:

the additional reference is a media object identified by comparing the  
composite reference information to object information for media objects.  
20

16. The method of claim 14, further comprising:

comparing the revised composite reference information to object information  
for media objects in the collection of media objects.

25 17. The method of claim 1, wherein:

comparing the composite reference information to object information for  
media objects in a collection of media objects includes assigning a  
similarity value to each of the media objects in the collection of media

5            objects, the similarity value indicating the similarity of the object to the  
             composite reference information.

18. The method of claim 17, wherein:

10            the similarity value of each of the media objects in the collection of media  
             objects is less than or equal to a similarity value calculated for each  
             reference object.

19. The method of claim 17, further comprising:

15            ranking the media objects according to their similarity values;  
             wherein selecting a media object in the collection of media objects based upon  
             the comparison of the object information and the composite reference  
             information includes selecting a media object based upon its rank.

20. The method of claim 8, wherein:

20            the object information for each of the reference and media objects is expressed  
             as a feature vector of components; and  
             each feature vector includes one or more components representing a feature of  
             the corresponding reference or media object.

25    21. The method of claim 20, wherein:

             combining object information for a plurality of reference objects includes  
             combining the feature vectors of the plurality of reference objects to  
             produce a composite reference vector.

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5 22. The method of claim 21, wherein:

each feature vector includes one or more components representing metadata  
associated with the corresponding reference or media object; and  
combining object information for a plurality of reference objects includes  
combining components representing a feature of part or all of each  
10 reference object according to a first combination function and combining  
the one or more components representing metadata associated with part or  
all of each reference object according to a second combination function.

23. The method of claim 21, further comprising:

15 defining a weighting vector for one or more of the features, the weighting  
vector specifying a relative importance for the corresponding features;  
wherein combining the feature vectors includes using the weighting vector to  
specify a relative importance of the features.

20 24. The method of claim 21, wherein:

combining the feature vectors includes using a Min or Max function.

25. The method of claim 21, wherein:

25 comparing the composite reference information to object information for  
media objects in a collection of media objects includes comparing the  
composite reference vector to the feature vectors of each of a plurality of  
media objects in the collection of media objects.

26. The method of claim 25, wherein:



5 comparing the composite reference vector to the feature vectors of each of a plurality of media objects includes using a Min or Max function.

27. The method of claim 1, wherein:

10 combining object information for a plurality of reference objects includes using a combination function;  
comparing the composite reference information to object information for media objects in a collection of media objects includes using a comparison function that is based upon the combination function.

15 28. The method of claim 1, wherein:

the object information characterizes features of the reference objects and the media objects in the collection of media objects and is expressed as a feature vector of components;  
combining object information for a plurality of reference objects includes  
20 combining the feature vectors of the plurality of reference objects using a Min or Max function to produce a composite reference vector;  
comparing the composite reference information to object information for the media objects in the collection of media objects includes comparing the composite reference vector to the feature vectors of each media object in  
25 the collection of media objects using a Min or Max function and assigning a similarity value to each media object in the collection of media objects, the similarity value indicating the similarity of the feature vector of the media object to the composite reference vector, where the similarity value

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5 of each of the media objects in the collection of media objects is less than or equal to a similarity value calculated for each reference object.

29. A computer program product on a computer-readable medium, for searching a  
10 collection of media objects, the computer program comprising instructions operable to cause a programmable processor to:  
combine object information for a plurality of reference objects to produce  
composite reference information representing criteria for a search;  
compare the composite reference information to object information for media  
15 objects in a collection of media objects to identify one or more media objects in the collection of media objects.

30. The computer program product of claim 29, further comprising instructions  
operable to cause a programmable processor to:  
20 receive user input specifying the plurality of reference objects.

31. The computer program product of claim 29, further comprising instructions  
operable to cause a programmable processor to:  
select a media object in the collection of media objects based upon the  
25 comparison of the object information and the composite reference information.

32. The computer program product of claim 29, wherein:

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5 the plurality of reference objects includes one or more objects having a type  
selected from: audio, image, text, CD, or video.

33. The computer program product of claim 32, wherein:

instructions to combine object information for a plurality of reference objects  
10 include instructions to combine object information for different types of  
objects.

34. The computer program product of claim 29, wherein:

instructions to combine object information for a plurality of reference objects  
15 to produce composite reference information include instructions to  
determine the intersection of the object information for the reference  
objects.

35. The computer program product of claim 29, wherein:

20 instructions to combine object information for a plurality of reference objects  
to produce composite reference information include instructions to  
determine the union of the object information for the reference objects.

36. The computer program product of claim 29, wherein:

25 the object information characterizes features of the reference objects and the  
media objects in the collection of media objects.

37. The computer program product of claim 36, wherein:

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5 the object information is weighted to specify a relative importance of the features.

38. The computer program product of claim 36, further comprising instructions operable to cause a programmable processor to:  
10 receive user input indicating the relative importance of the features.

39. The computer program product of claim 36, wherein:  
at least one feature is represented by the relative frequency of occurrence of each of several values for the feature.

15 40. The computer program product of claim 36, wherein:  
the set of features includes color information describing the relative frequency of occurrence of colors in an object.

20 41. The computer program product of claim 36, wherein:  
a feature for a first object type is mapped to a feature for a second object type.

42. The computer program product of claim 29, further comprising instructions operable to cause a programmable processor to:  
25 combine object information for an additional reference object with the composite reference information to revise the composite reference information.

43. The computer program product of claim 42, wherein:

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5 the additional reference is a media object identified by comparing the  
composite reference information to object information for media objects.

44. The computer program product of claim 42, further comprising instructions  
operable to cause a programmable processor to:

10 compare the revised composite reference information to object information for  
media objects in the collection of media objects.

45. The computer program product of claim 29, wherein:

15 instructions to compare the composite reference information to object  
information for media objects in a collection of media objects include  
instructions to assign a similarity value to each of the media objects in the  
collection of media objects, the similarity value indicating the similarity of  
the object to the composite reference information.

20 46. The computer program product of claim 45, wherein:

the similarity value of each of the media objects in the collection of media  
objects is less than or equal to a similarity value calculated for each  
reference object.

25 47. The computer program product of claim 45, further comprising instructions  
operable to cause a programmable processor to:

rank the media objects according to their similarity values; wherein  
instructions to select a media object in the collection of media objects based  
upon the comparison of the object information and the composite reference

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5 information include instructions to select a media object based upon its rank.

48. The computer program product claim 36, wherein:

10 the object information for each of the reference and media objects is expressed as a feature vector of components; and each feature vector includes one or more components representing a feature of the corresponding reference or media object.

49. The computer program product of claim 48, wherein:

15 instructions to combine object information for a plurality of reference objects include instructions to combine the feature vectors of the plurality of reference objects to produce a composite reference vector.

50. The computer program product of claim 49, wherein:

20 each feature vector includes one or more components representing metadata associated with the corresponding reference or media object; and combining object information for a plurality of reference objects includes combining components representing a feature of part or all of each reference object according to a first combination function and combining  
25 the one or more components representing metadata associated with part or all of each reference object according to a second combination function.

51. The computer program product of claim 49, further comprising instructions operable to cause a programmable processor to:

5       define a weighting vector for one or more of the features, the weighting vector  
specifying a relative importance for the corresponding features;  
wherein instructions to combine the feature vectors include instructions to use  
the weighting vector to specify a relative importance of the features.

10    52. The computer program product of claim 49, wherein:

instructions to combine the feature vectors include instructions to use a Min or  
Max function.

53. The computer program product of claim 49, wherein:

15    instructions to compare the composite reference information to object  
information for media objects in a collection of media objects include  
instructions to compare the composite reference to the feature vectors of  
each of a plurality of media objects in the collection of media objects.

20    54. The computer program product of claim 53, wherein:

instructions to compare the composite reference vector of the reference object  
to the feature vectors of each of a plurality of media objects include  
instructions to use a Min or Max function.

25    55. The computer program product of claim 29, wherein:

instructions to combine object information for a plurality of reference objects  
include instructions to use a combination function;  
instructions to compare the composite reference information to object  
information for media objects in a collection of media objects include

5 instructions to use a comparison function that is based on the combination function.

56. The computer program product of claim 29, wherein:

the object information characterizes features of the reference objects and the

10 media objects in the collection of media objects and is expressed as a feature vector of components;

combining object information for a plurality of reference objects includes

combining the feature vectors of the plurality of reference objects using a

Min or Max function to produce a composite reference vector;

15 comparing the composite reference information to object information for the

media objects in the collection of media objects includes comparing the

composite reference vector to the feature vectors of each media object in

the collection of media objects using a Min or Max function and assigning

a similarity value to each media object in the collection of media objects,

20 the similarity value indicating the similarity of the feature vector of the media object to the composite reference vector, where the similarity value of each of the media objects in the collection of media objects is less than or equal to a similarity value calculated for each reference object.

25 57. A system for searching a collection of media objects, comprising:

means for combining object information for a plurality of reference objects to

produce composite reference information representing criteria for a search;

and



5 means for comparing the composite reference information to object  
information for media objects in a collection of media objects to identify  
one or more media objects in the collection of media objects.

58. The system of claim 57, wherein:

10 means for comparing the composite reference information to object  
information for media objects in the collection of media objects includes  
means for assigning a similarity value to each of the media objects in the  
collection of media objects; the similarity value indicating the similarity of  
the object to the composite reference information, wherein the similarity  
15 value of each of the media objects in the collection of media objects is less  
than or equal to a similarity value calculated for each reference object.

59. The system of claim 57, wherein:

the object information characterizes features of the reference objects and the  
20 media objects in the collection of media objects and is expressed as a  
feature vector of components;  
means for combining object information for a plurality of reference objects  
includes means for combining the feature vectors of the plurality of  
reference objects to produce a composite reference vector; and  
25 means for comparing the composite reference information to object  
information for media objects in a collection of media objects includes  
means for comparing the composite reference vector to the feature vectors  
of each of the media objects in the collection of media objects.